

0.9°C and  $69 \pm 6$  per cent relative humidity, in the laboratory.

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MANINDER  
G. C. VARMA

#### REFERENCE

NAGARAJA, H. AND NAGARKATTI, S. (1969): Three new species of *Trichogramma* (Hymenoptera: Trichogrammatidae) from India. *Entomophaga* 41: (4): 393-400.

### 27. THE CARPENTER BEE (*XYLOCOPA FENESTRA*) IN THE INDIAN THAR DESERT

The Carpenter-bee (*Xylocopa fenestra*), on the one hand damages timber and on the other acts as a prominent pollinating agent. Hence it is of much economic and biological importance. These observations on *Xylocopa* were made around Jodhpur city, and desert areas of Jodhpur and Jaisalmer districts from February 1976 to May 1979.

*Habitat and distribution.* Light jungles of *Acacia senegal* as well as of *Calotropis procera*, large orchards and gardens, agricultural farms having large trees and vegetable crops and villages having thatched huts were the favourite haunts of *Xylocopa* and *Calotropis* scrub and gardens with large flower flowering trees were the preferred habitats.

*Roost sites (tunnels).* For the roost tunnels, thick *Calotropis* shrubs were preferred, in the wild. Its roost tunnels were observed in thick dry stems of *Capparis*, castor (*Ricinus communis*) grown in farms and courts of houses and *Jatropha gossypifolia* in gardens. The tunnels were also observed in the dry wood of

several other trees such as *Prosopis cineraria*, *Ficus religiosa* and *Acacia senegal* etc.

In city areas it has taken to roosting in empty open water pipes of houses, five *Xylocopas* have been living in such pipes in my house.

#### *Favourite flowers*

IN THE WILD. *Calotropis procera* and *Tephrosia purpurea* were observed to be the most favourite flowers for the *Xylocopa*, next were *Tecomella undulata*, *Prosopis cineraria*, *P. juliflora* and *Solanum xanthocarpus* etc.

IN GARDENS. Hollyhock (*Althae rosea*), *Cassia fistula*, *C. siamea*, *Luffa* spp., *Cucurbita* spp., *Antirrhinum orontium*, *Adhatoda vasica*, and *Ipomoea carnea* flowers were the favourite cultivated flora of *Xylocopa*.

*Daily activities cycle.* On mild winter days, it comes out about 30-45 minutes after sunrise and flies around most of the day (except at noon, if gets too hot) till sunset. In summer, it comes out early, about 30 minutes before sunrise and flies around for about three

hours after sunrise, then retreats to its hideout and again emerges late in afternoon about two hours before sunset to 30 minutes past sunset. *Annual activities cycle.* It was observed under hibernation from late November to early February when temperature is below 24°C, yet it was occasionally observed hovering during the mid-day on warm spells during the winter. It was observed to be in semiaestivation from May to June, when temperature rises above 35°C and humidity was low (less than 60%), flying only in the early morning and late afternoon.

In the rainy season it was active after rains,

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but hides during showers.

*Predators.* *Calotes versicolor* picks up the unwary *Xylocopa*. The green bee-eater (*Merops orientalis*), drongo (*Dicrurus adsimilis*) and the grey shrike (*Lanius excubitor*) were also observed, occasionally taking *Xylocopa*. Monitor lizard (*Varanus* sp.) catch them close to the roost site tunnel (log or dry branch of a tree).

*Breeding.* The young were mainly observed in March. The breeding tunnels were seen in *Calotropis*, *Capparis* and *Prosopis cineraria* trees or Shrubs and dry wood stems.

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## 28. *CATOPSILIA CROCALE/POMONA*

I refer to R. K. Varshney's paper under the title *Revised Nomenclature for Taxa in Wynter-Blyth's book on the BUTTERFLIES OF INDIAN REGION* (1980, *J. Bombay nat. Hist. Soc.*, 76 (1): 33-41) and his new combination of *Catopsilia crocale crocale* Cr. and *Catopsilia crocale pomona* F. and his statement that "numerous authors have reported that they interbreed in the nature and are, thus, conspecific". Talbot "FAUNA OF BRITISH INDIA, *Butterflies*, i. (2nd edit.) is not nearly as categorical as Varshney implies. He writes "in the Indian area there is no difficulty in separating them, but in the Malayan islands, and in Australia and New Guinea, the characters, so constant in India, become intermixed and much difficulty is experienced in separating the two forms". He goes on to quote Corbet as saying that in Malaya pairs found in *copula* are always *crocale* × *crocale* or *pomona* × *pomona*, and adds a remark by Corbet that he(Corbet)

feels certain that in Malaya they are not conspecific, whatever may be the position in the more easterly parts of their range. Frustorfer, in Setz' INDO-AUSTRALIAN RHOPALOCERA, states categorically that the genitalia differ, in contradiction to Talbot, who states that they are the same. Frustorfer goes on to write that both de Niceville and Hagen state that both species have been bred from the same brood. In spite of these statements, both Frustorfer and Talbot treat the two as separate species. In Australia, I.F.B. Common in AUSTRALIAN BUTTERFLIES (*Jacaranda Pocket Guides*) treats both as forms, not subspecies, of *C. pomona* and says nothing about interbreeding.

Personally, I would prefer to treat them as separate species until considerably more experimental breeding has been done. With the technique of hand-pairing this should not be difficult.

I also wonder how careful and accurate de